Ordering number : EN2010D

Monolithic Linear IC

LA7053

Video, Audio Signal Processor for UHF Band RF Modulators

Overview

The LA7053 is a video, audio signal processor IC for UHF band RF modulators. It performs the functions of TSG (test signal generator), audio FM modulator, video clamp circuit, white clip circuit.

Features

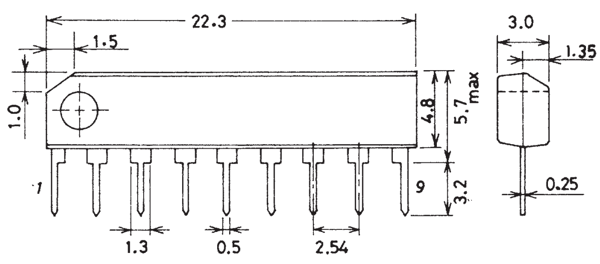
- White clip function.
- On-chip TSG (two vertical white stripes).
- Small-sized package (9-pin SIP).

Package Dimensions

unit: mm

3017C-SIP9

[LA7053]



SANYO: SIP9

Specifications

Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V_{CC} max	V7	12	V
Allowable power dissipation	Pd max	Ta≤60°C	250	mW
Operating temperature	Topr		–20 to +80	°C
Storage temperature	Tstg		–40 to +125	°C

Operating Conditions at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	V_{CC}	V7	7.5	V
Operating voltage range	V_{CC} op		7.0 to 8.0	V

Operating Characteristics at Ta=25°C, V_{CC}(V7)=7.5V

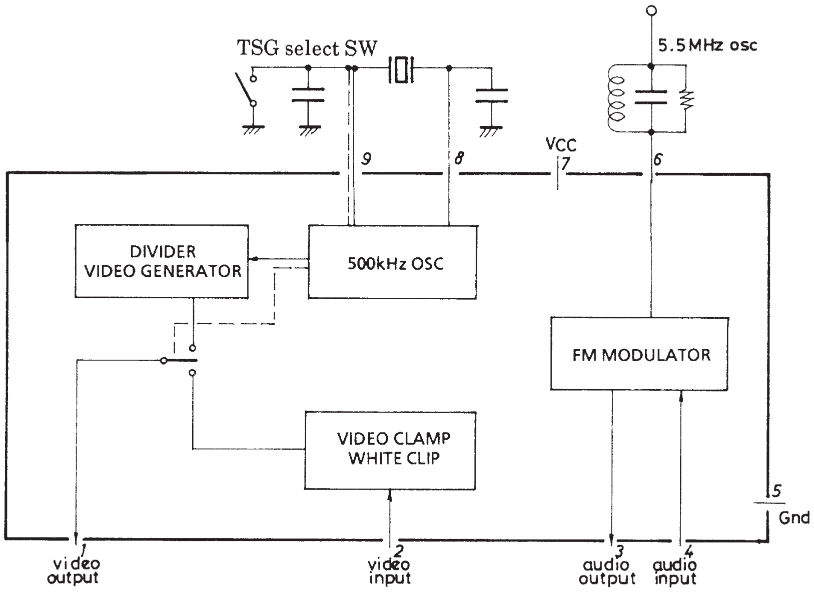
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
V_{CC}7 current drain	I_{CC}7	SW5 ON	12.0	20.0	28.0	mA
Video clamp voltage	V_{VC}	SW5 ON, SW1 ON, SW2→b, SW3→a	3.7	3.9	4.1	V
Video clamp output amplitude deviation		SW→2b, SW3→a, SW5 ON at 1Vp-p stair step signal input	–5		+5	%
Audio FM sensitivity	Δf_{fm}	f_m : 1kHz, 4.5Vp-p input, f_C : 5.5MHz	870	1200	1500	Hz/mV
Audio distortion	THD	SW4 on at deviation width 100kHz		0.3	2.5	%
Audio output amplitude		f_C : 5.5MHz	0.79	1.00	1.26	Vp-p
White clip level	V_{WC}		1.16	1.19	1.22	Vp-p
TSG output amplitude	V_{TSG}		0.80	1.04	1.20	Vp-p
V/S ratio			7.2/2.8	6.5/3.5	6.0/4.0	

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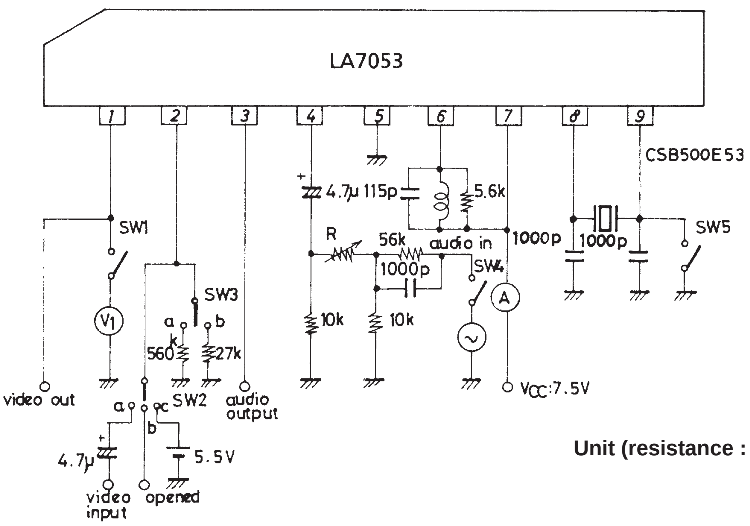
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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Horizontal sync frequency variation	f_S		–5		+5	%
Horizontal sync signal width variation	H_S		3.6	1.0	4.4	µs
White signal width variation	H_V		3.6	4.0	4.4	µs
Sync 1st white signal rise time	t_V1		22	24	26	µs
Sync 2nd white signal rise time	t_V2		22	24	26	µs

Equivalent Circuit Block Diagram

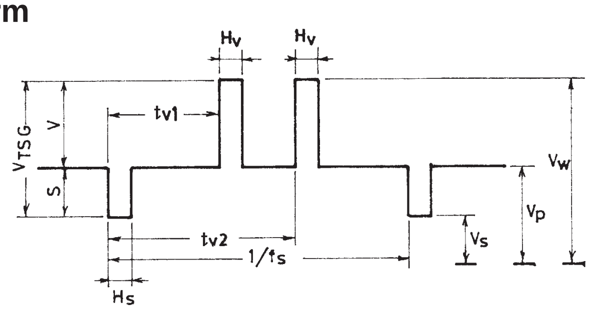


Test Circuit

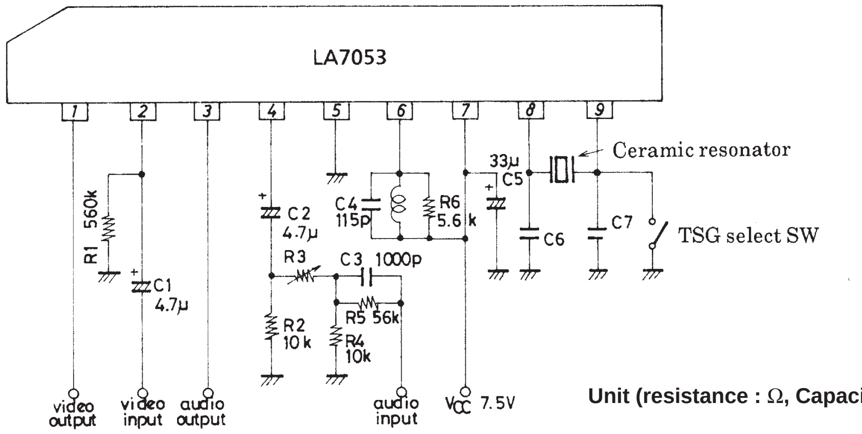


Unit (resistance : Ω, Capacitance : F)

TSG Output Waveform



Sample Application Circuit



Unit (resistance : Ω, Capacitance : F)

Ceramic resonator	C6	C7
CSB500E53 (Murata)	1000pF	1000pF
DCRK500 (Toko)	680pF	330pF

Test Conditions

Parameter	Symbol	SW Mode					Test point	Remarks
		SW1	SW2	SW3	SW4	SW5		
$V_{CC}7$ current drain	$I_{CC}7$	OFF	b	a	OFF	ON	Pin 7	
Video clamp voltage	V_{VC}	ON	b	a	OFF	ON	Pin 1	
Video clamp output amplitude deviation		OFF	a	a	OFF	ON	Pin 1	
Audio FM sensitivity	Δf_{fm}	OFF	b	a	ON	ON	Pin 3	
Audio distortion	THD	OFF	b	a	ON	ON	pin 3	
Audio output amplitude		OFF	b	a	OFF	ON	Pin 3	
White clip level	$V_{WC}1$	ON	c	a	OFF	ON	Pin 1	$V_{WC}=V_{WC}1-V_{WC}2$
	$V_{WC}2$	ON	b	b	OFF	ON	Pin 1	
TSG output amplitude	V_{TSG}	OFF	b	a	OFF	OFF	Pin 1	
V/S ratio		OFF	b	a	OFF	OFF	Pin 1	
Horizontal sync frequency variation	f_S	OFF	b	a	OFF	OFF	Pin 1	
Horizontal sync signal width variation	H_S	OFF	b	a	OFF	OFF	Pin 1	
White signal width variation	H_V	OFF	b	a	OFF	OFF	Pin 1	
Sync 1st white signal rise time	t_V1	OFF	b	a	OFF	OFF	Pin 1	
Sync 2nd white signal rise time	t_V2	OFF	b	a	OFF	OFF	Pin 1	